

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:

Group Art Unit:

DUPRAY et al.

Examiner:

Serial No.: Not Yet Assigned

PRELIMINARY AMENDMENT

Filed: Filed Herewith

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For: "LOCATION OF A MOBILE
STATION USING A PLURALITY
OF COMMERCIAL WIRELESS
INFRASTRUCTES"

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Prior to the initial review of the above-identified patent application by the Examiner, please enter the following Preliminary Amendment. Although Applicants do not believe that any fees are due based upon the filing of this Preliminary Amendment, please charge any such fees to Deposit Account 19-1970.

Please amend the above-identified patent application as follows:

IN THE SPECIFICATION:

Please insert the following "RELATED APPLICATIONS" section after the title on page 1:

--The present application is a continuation of co-pending U.S. Application No. 09/230,109 filed January 22, 1999 which is the National Stage of International Application No. PCT/US97/15933 filed September 8, 1997 (and claims the benefit thereof) which, in turn, claims

the benefit of the following three applications: U.S. Provisional Application No. 60/056,603 filed August 20, 1997, U.S. Provisional Application No. 60/044,821 filed April 25, 1997; and U.S. Provisional Application No. 60/025,855 filed September 9, 1996. All the above cited references are fully incorporated by reference herein.—

IN THE CLAIMS:

Please cancel Claims 1-79 without prejudice to or disclaimer of the subject matter contained therein, and add the following new claims 80-87.

80. A method for locating a wireless mobile station, comprising:

receiving first data related to wireless signals communicated between a particular mobile station and at least a first network of a plurality of commercial mobile service provider networks, wherein for each said network, there are a plurality of base stations for at least one of transmitting and receiving wireless signals with a corresponding plurality of mobile stations registered with the network, and wherein said particular mobile station is registered with said first network for subscribing to a wireless service;

first requesting a first location estimate of the particular mobile station, wherein a first location estimator provides said first location estimate of the particular mobile station when said first location estimator is supplied with first location information including data obtained using the first data, said location information capable of changing with a change in a location of the particular mobile station;

wherein when said first location estimate is one of: (a) deemed ambiguous, (b) can not be provided, (c) is not within a desired range of accuracy, and (d) has an extent greater than or equal to a predetermined size, then the steps (A1) and (A2) are performed:

(A1) instructing said particular mobile station to communicate with a second network of the plurality of networks for supplying second data, wherein said particular mobile station is not registered with said second network for subscribing to a wireless service, and wherein said second data is obtained using wireless signals communicated between the particular mobile station and the second network;

(A2) second requesting a second location estimate of said particular mobile station wherein said second location estimate is obtained using additional location information obtained at least in part from the second data;

outputting at least one of the first and second estimates of the location of the mobile station as an estimate of the location of the mobile station.

81. A method for locating a wireless mobile station, comprising:

first receiving first signal characteristic measurements of wireless signals communicated between a mobile station and a first network of communication stations, wherein said communication stations in the first network are cooperatively linked by a first wireless service provider for wirelessly communicating with the mobile station;

instructing the mobile station to search for a wireless signal from a second network of communication stations that are cooperatively linked by a second wireless service provider for providing wireless communication, wherein said mobile station is a subscriber of said first wireless service provider, and said mobile station is not a subscriber of said second wireless service provider;

second receiving second signal characteristic measurements of wireless signals communicated between the mobile station and said second network of communication stations;

estimating a location of the mobile station using at least one of said first and second signal characteristic measurements.

82. A method for locating a wireless mobile station as claimed in Claim 81, wherein the mobile station is registered for a wireless communication service with the first wireless service provider, and the mobile station is not registered for the wireless communication service with the second wireless service provider.

83. A method for locating a wireless mobile station as claimed in Claim 81, wherein said step of instructing includes transmitting a command to the mobile station for instructing the mobile station to search for a signal from a communication station of said second wireless service provider in a frequency bandwidth different from a frequency bandwidth for communicating with the communication stations of said first wireless service provider.

84. A method for locating a wireless mobile station, as claimed in Claim 81, wherein said step of estimating includes a step of computing a most likely location of said mobile station using a fuzzy logic computation.

85. An apparatus for locating a first mobile station, wherein the first mobile station communicates via wireless signals with a first wireless network infrastructure having: a plurality of spaced apart communication stations for wireless communication with said first mobile station, wherein at least one of said first mobile station and said first wireless network infrastructure has a capability for obtaining a plurality of multipath measurements for one of: one or more forward transmissions to said first mobile station, and one or more reverse

transmissions from said first mobile station to said first wireless network infrastructure, and wherein said multipath measurements are derived from both fixed clutter and variable clutter, comprising:

an interface for receiving values indicative of said multipath measurements for at least one of said forward transmissions and said reverse transmissions;

a mobile station location determining system for locating said first mobile station, wherein said location determining system uses the values, and generates additional values that have an enhanced dependence on multipath measurements derived from fixed clutter as compared to multipath measurements derived from variable clutter;

wherein said mobile station location determining system includes at least one wireless location determining model for estimating a location of said first mobile station, said at least one model uses one or more of said transformed values;

an output interface for outputting to one of: a communication network that provides telephony services, and the Internet a resulting location estimate of said first mobile station, said resulting location estimate obtained from said location determining system.

86. An apparatus for locating a mobile station, comprising:

a wireless network for communicating with a plurality of mobile stations, wherein said network at least one of: transmits and receives wireless signals from the mobile station, and wherein said wireless signals are transmitted by the network in a forward bandwidth and said wireless signals are received at the network in a different reverse bandwidth, and, said wireless network includes a plurality of spaced apart communication stations for communicating via said wireless signals with said plurality of mobile stations;

an interface for supplying to a mobile station location obtaining system measurements including: (i) first measurements of said wireless signals transmitted to the mobile station in said forward radio bandwidth, and (ii) second measurements of said wireless signals received from the mobile station in said reverse radio bandwidth;

wherein said mobile station location obtaining system estimates a location of said first mobile station using both said first measurements and said second measurements.

87. The apparatus of Claim 86, wherein said interface provides to said mobile station obtaining system data indicative of CDMA finger measurements related to said radio signals communicated between the network and the mobile station.

88. A method for locating a mobile station using wireless signal measurements obtained from transmissions between the mobile station and at least one of a plurality of communication stations, wherein each of said communications stations includes one or more of a transmitter and a receiver for wirelessly communicating with the mobile station, comprising::

transmitting to the mobile station, a control message from one of the communication stations, wherein said message is received by a receiving antenna of said mobile station;

wherein the control message requests activation of at least one of a control processor and a searcher receiver in the mobile station, for determining a plurality of multipath finger sets for a wireless communication between said mobile station and at least a first of the communication stations, wherein for at least some of said multipath finger sets are different;

receiving information related to said finger sets in response to transmissions from the mobile station;

supplying said information for at least one of said finger sets to a mobile station location estimator for estimating a location of said mobile station.

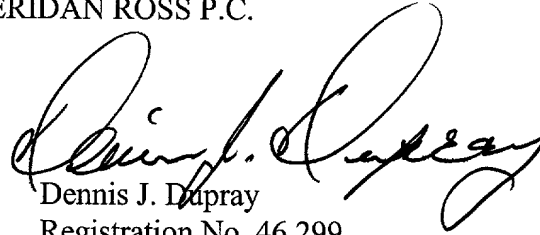
REMARKS

Please enter the above provided new claims. It is believed that no fees are due with this submittal beyond those of the filing fee. If, however, further fees are due, it is requested that the Applicant named below be contacted by phone at 303-863-2975.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claims 80-87 have been added.